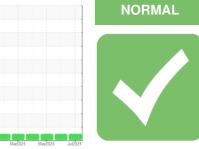


OIL ANALYSIS REPORT

Sample Rating Trend



Area (34748UA) Machine Id 811061 Component Main Diesel Engi Fluid DIESEL ENGINE

811061 Component Main Diesel Engine Fluid

DIESEL ENGINE OIL SAE 40 (--- GAL)

DIAGNOSIS Recommendation

Resample at the next service interval to monitor. Please specify the brand, type, and viscosity of the oil on your next sample.

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

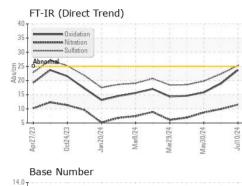
Fluid Condition

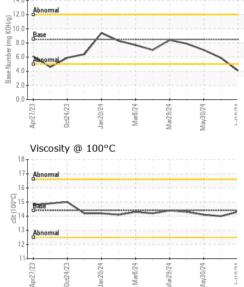
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0127183	GFL0122010	GFL0122066
Sample Date		Client Info		10 Jul 2024	25 Jun 2024	30 May 2024
Machine Age	hrs	Client Info		7882	7755	7530
Oil Age	hrs	Client Info		7147	7245	7159
Oil Changed		Client Info		Changed	Not Changd	Not Changd
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>120	14	9	7
Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Nickel	ppm	ASTM D5185m	>5	0	<1	<1
Titanium	ppm	ASTM D5185m		<1	<1	<1
Silver	ppm	ASTM D5185m	>2	<1	0	0
Aluminum	ppm	ASTM D5185m	>20	3	4	2
Lead	ppm	ASTM D5185m	>40	3	2	<1
Copper	ppm	ASTM D5185m		2	2	<1
Tin	ppm	ASTM D5185m	>15	- <1	<1	<1
Vanadium	ppm	ASTM D5185m		<1	<1	<1
Cadmium	ppm	ASTM D5185m		0	0	<1
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base 250	current 12	history1 12	history2 17
	ppm ppm		250			
Boron Barium	ppm	ASTM D5185m		12	12	17
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m	250 10	12 <1	12 0	17 0
Boron Barium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	250 10	12 <1 67	12 0 62	17 0 61
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100	12 <1 67 0	12 0 62 <1	17 0 61 0
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450	12 <1 67 0 948	12 0 62 <1 1000	17 0 61 0 893
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000	12 <1 67 0 948 1271	12 0 62 <1 1000 1210	17 0 61 0 893 1123
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150	12 <1 67 0 948 1271 1008	12 0 62 <1 1000 1210 1182	17 0 61 0 893 1123 1033
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350	12 <1 67 0 948 1271 1008 1332	12 0 62 <1 1000 1210 1182 1419	17 0 61 0 893 1123 1033 1263
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250	12 <1 67 0 948 1271 1008 1332 2634	12 0 62 <1 1000 1210 1182 1419 3493	17 0 61 0 893 1123 1033 1263 3210
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base	12 <1 67 0 948 1271 1008 1332 2634 current	12 0 62 <1 1000 1210 1182 1419 3493 history1	17 0 61 0 893 1123 1033 1263 3210 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >25	12 <1 67 0 948 1271 1008 1332 2634 <i>current</i> 5	12 0 62 <1 1000 1210 1182 1419 3493 history1 5	17 0 61 0 893 1123 1033 1263 3210 history2 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >25 >216	12 <1 67 0 948 1271 1008 1332 2634 <u>current</u> 5 0	12 0 62 <1 1000 1210 1182 1419 3493 history1 5 5	17 0 61 0 893 1123 1033 1263 3210 history2 3 <1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >25 >216 >20	12 <1 67 0 948 1271 1008 1332 2634 <u>current</u> 5 0 3	12 0 62 <1 1000 1210 1182 1419 3493 history1 5 5 5 4	17 0 61 0 893 1123 1033 1263 3210 history2 3 < 1 3 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >25 >216 >216 >20 limit/base	12 <1 67 0 948 1271 1008 1332 2634 <i>current</i> 5 0 3 <i>current</i>	12 0 62 <1 1000 1210 1182 1419 3493 history1 5 5 5 4 Kistory1	17 0 61 0 893 1123 1033 1263 3210 history2 3 <1 3 1263 3210
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 limit/base >25 >216 >216 >20 limit/base	12 <1 67 0 948 1271 1008 1332 2634 <i>current</i> 5 0 3 <i>current</i> 0.3	12 0 62 <1 1000 1210 1182 1419 3493 history1 5 5 5 4 history1 0.2	17 0 61 0 893 1123 1033 1263 3210 history2 3 <1 3 1 2 6 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 iimit/base >25 >216 >216 >20 iimit/base	12 <1 67 0 948 1271 1008 1332 2634 <i>current</i> 5 0 3 <i>current</i> 0.3 11.5	12 0 62 <1 1000 1210 1182 1419 3493 history1 5 5 5 4 history1 0.2 9.9	17 0 61 0 893 1123 1033 1263 3210 history2 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	250 10 100 450 3000 1150 1350 4250 imit/base >25 >216 >20 imit/base >4 >20 >30	12 <1 67 0 948 1271 1008 1332 2634 <i>current</i> 5 0 3 <i>current</i> 0.3 11.5 25.3	12 0 62 <1 1000 1210 1182 1419 3493 history1 5 5 5 4 history1 0.2 9.9 22.3	17 0 61 0 893 1123 1033 1263 3210 history2 3 <1 3 <1 3 history2 0.2 8.7 19.8
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAC	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7844	250 10 100 450 3000 1150 1350 4250 imit/base >25 >216 >20 imit/base >4 >20 >30 imit/base	12 <1 67 0 948 1271 1008 1332 2634 <i>current</i> 5 0 3 <i>current</i> 0.3 11.5 25.3 <i>current</i>	12 0 62 <1 1000 1210 1182 1419 3493 history1 5 5 5 4 history1 0.2 9.9 22.3 history1	17 0 61 0 893 1123 1033 1263 3210 history2 3 <1 3 <1 3 history2 0.2 8.7 19.8 history2



OIL ANALYSIS REPORT





VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPE	RTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	14.4	14.3	14.0	14.1
GRAPHS						

Ferrous Alloys 35 30 25 20 15 10 5. 0 Apr27/23 an20/24 Mar8/24 Aar79/74 av30/24 Non-ferrous Metals 10 lead Apr27 (ct24 Viscosity @ 100°C Base Number 18 14.0 17 12.0 r (mg KOH/g) 16 10.0 cSt (100°C) 8.0 umber (6.0 13 Base N 4 (Abnorma 12 2.0 11-0.0 Jul10/24. Jan 20/24 Jul10/24 Apr27/23 0ct24/23 Mar8/24 Mar29/24 May30/24 Apr27/23 Mar8/24 Mav30/24 an 20/74 Mar29/24 Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 GFL Environmental - 652 - Fredericksburg Hauling Sample No. : GFL0127183 Received : 15 Jul 2024 10954 Houser Drive Lab Number : 06235549 Tested : 15 Jul 2024 Fredericksburg, VA Unique Number : 11124383 Diagnosed : 15 Jul 2024 - Wes Davis US 22408 Contact: WILLIAM MILO



* - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Submitted By: TECHNICIAN ACCOUNT

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